CLASS III UIC PERMIT
APPLICATION FOR PRODUCTION OF BRINE FROM SUB-SURFACE FORMATIONS BY HYDRAULIC METHODS

<table>
<tr><td rowspan="4">Submit to:
Kansas Department of Health
& Environment
Bureau of Water – Geology Section
1000 SW Jackson Street, Suite 420
Topeka, Kansas 66612-1367</td><td colspan="4">Date of Application:</td></tr>
<tr><td colspan="4">KDHE UIC Permit No.:</td></tr>
<tr><td colspan="4">Well (s)#:</td></tr>
<tr><td>Legal Description:</td><td>1/4</td><td>1/4</td><td>1/4</td></tr>
<tr><td rowspan="4">Owner's Name:

Mailing Address:

Telephone #:

E-Mail:</td><td>Sec.</td><td>T S</td><td>R</td><td>E W</td></tr>
<tr><td colspan="4">feet from south line of SE/4</td></tr>
<tr><td colspan="4">feet from east line of SE/4</td></tr>
<tr><td colspan="4">County: _____
GPS Coordinates:
Latitude:_____ Long:_____</td></tr>
<tr><td></td><td colspan="4">Check One: ☐ Gallery ☐ Single Wells</td></tr>
<tr><td>Operator's Name:

Mailing Address:

Telephone #:

E-Mail:</td><td colspan="4">Facility Name:

Mailing Address:

Telephone #:

E-Mail:</td></tr>
<tr><td colspan="5">Contact Person's Name:

Mailing Address:

Telephone #:

Fax:

E-Mail:</td></tr>
</table>

In conformity with the provisions of K.S.A. 65-171d, the undersigned, representing

_____

(Name of company, corporation or person applying)

hereby makes application to the Kansas Department of Health and Environment for a permit to construct a salt solution mining well, the location of which is described above and also shown on an attached well-field map. This application shall be signed by an executive officer of a level of at least Vice-President or as otherwise authorized by K.A.R. 28-46-22. The operator is required to submit this application.

1. Production of brine by hydraulic means is desired within the _____ formation. The top of the salt is at a depth of _____ feet and the bottom of the salt is at a depth of _____ feet.

2. Maximum injection rate: _____ gpm.
   Maximum injection pressure: _____ psig at the wellhead.

3. Provide the predicted fracture pressure of the salt. Include the calculations and/or methodology used to determine the fracture pressure of the salt. Provide calculations demonstrating the bottom hole injection pressure will not exceed the predicted fracture pressure, including a safety factor. Describe the source(s) of information.

4. Describe the brine production process for the salt solution mining project. Include the number of wells through which the fluid will be cycled to achieve saturation. Submit a flow diagram depicting the process.

5. Provide a chemical analysis of the injection fluid and a description of the source of the injection fluid. The fluid shall be analyzed for pH, TDS, hardness, alkalinity, chloride, sodium and sulfate. All analyses shall be conducted by a laboratory certified by the State of Kansas.

6. Well Completion:

   Provide borehole, casing, tubing, and cement information. Surface casing and production casing for new wells shall be new and cemented bottom to top by circulating.

Borehole Size	Casing/ Tubing size	Material	Weight (lbs/ft)	Casing Seat Depth	Type Cement & additives	Amount Cement (Sacks)	Cemented Interval From To

7. Provide a schematic drawing of the well completion (surface and subsurface).

8. Provide the calculations, formulas, equations and methodology used to determine that the casing and cement are designed to tolerate the pressures or forces anticipated to be encountered or exerted on the well during construction, completion and operation. Include design factors used. Describe the maximum burst, collapse and tensile stress which may be experienced. Submit service company recommendations describing the suitability of the selected cement mixtures. Describe the type, grade, additives, slurry weight and expected compressive strength of the cement. Describe the cementing technique and equipment used including guide shoe, cement shoe, float collar, plugs, baskets, D V tools and the locations of these in the well. Describe the number and location of centralizers, wall scratchers, etc.

9. Provide a construction and completion prognosis for the well. This should be a narrative or list of all steps undertaken during construction and completion and should include the set-up, drilling, setting of casing, cementing, logging, cuttings disposal and testing.

10. Describe the disposal method for excess or waste brine resulting from the solution mining operation. Provide a flow diagram.

11. Describe how drilling fluids and the formation cuttings will be contained to prevent contamination of the fresh and/or usable water. Describe the dimensions of the tanks or pits to be used to contain the drilling fluids and formation cuttings. Compare the dimensions with the volume of fluid and cuttings anticipated. Describe the artificial liner to be used in any pits. Discuss how the fluids in the drilling pit or tank will be disposed and describe the closure. Discuss how the fluids and formation cuttings in the reserve pit or tank will be disposed. Describe the closure of any
pits.

12. If the wells are to be operated as a gallery, provide a detailed plan for connecting the wells within this gallery. If hydraulic fracturing is to be used, describe how the process will be monitored to detect problems. Describe the location of perforations, the pressures to be used, the estimated volume of fluid needed, and preferential fracturing patterns for the area. Describe how it will be determined whether the fracturing process has been successful or has failed to connect.

13. Discuss how monitoring requirements will be met. Describe the meters or gauges used to measure injection volume, injection rate and injection pressure. Provide a diagram indicating the location(s) of monitoring devices. Provide a quality assurance/quality control plan for obtaining reliable monitoring data. Describe the method of calibration and frequency of calibration of gauges and meters. Provide a plan describing the procedure and method used to obtain a representative sample of injected fluid and produced brine to meet monitoring requirements. Describe where the fluid samples will be collected and the method used to collect the samples. Give the name of the Kansas certified laboratory that will conduct the analysis. Describe the gamma ray logging, sonar calipers and elevation surveys to be conducted, including frequency.

14. Provide a plugging and abandonment plan for the well(s). Provide a diagram. Include the type, grade and quantity of the cement to be used in plugging. Describe the method of cement emplacement. Guidelines for developing a plugging and abandonment plan are attached.

15. Provide a map showing the well(s) to be permitted, oil field wells, brine production wells, injection wells, abandoned wells, dry holes, core holes, surface water bodies, hydrocarbon storage wells, springs, mines, quarries, water wells, monitoring wells, faults and other pertinent surface features within the 1/4-mile radius area of review. The 1/4-mile radius area of review shall be clearly drawn on the map. Provide a tabulation of data on all wells penetrating the salt section within the area of review including the current status, type, construction, date of drilling, location, depth and plugging or completion data. These wells are to be keyed to the map. Provide proposed corrective measurers required for wells in the area of review, if any.

16. Describe the protocol used to identify, locate and ascertain the condition of wells within the area of review which penetrate the salt zone.

17. Provide a plan for hydraulically pressure testing the casing ford determining mechanical integrity. Discuss both the initial pressure test and the periodic five-year pressure tests. Guidelines for pressure testing a Class III well are attached.

18. Provide 1) a geologic cross-section showing the vertical limits of the fresh and usable water, and the position of the interval to be mined, 2) a map indicating the direction of groundwater flow in the fresh and usable aquifer(s), 3) a structural contour map of the salt top, and 4) an isopach map of the salt section. Provide references for the information used to develop the maps and cross sections.

19. Provide (1) a USGS topographic map indicating the plant boundaries and well location, and 2) a map indicating the boundaries and ownerships of tracts of land adjacent to the applicant's plant boundaries. Include a list containing the names and mailing addresses of the owners of the tracts of land adjacent to the plant boundaries with the map. Information on the list shall be keyed to the map.

20. Describe and provide design information, plans and diagrams for all surface retention facilities, holding tanks, lines, transfer pumps and filters associated directly with the salt solution mining operation.

21. Provide a financial assurance mechanism demonstrating the resources are available to properly plug and abandon the well at the end of its useful life. Guidelines for demonstrating financial assurance are attached.

22. The permit will not become fully effective until the following have been submitted to and approved by KDHE:

    1. Complete drillers log.
    2. Complete casing and cementing records. Include cementing tickets, pipe tallies and work reports.
    3. Gamma ray log with top and bottom of salt section identified.
    4. Drilling and completion history.
    5. Cement bond log of the production string. An interpretation of the log by a person with the expertise to interpret the log shall be included.
    6. A schematic drawing showing the actual well completion at the surface and subsurface, if different from the proposal.
    7. Results of the casing hydraulic pressure test to check the well integrity. Results shall be submitted in the format described in KDHE guidelines.

23. An owner or operator of any construction activity such as a new well or a combination of construction activities in a common plan of development who engages in construction activities which will disturb one (1) or more acres of soil needs to receive authorization from KDHE to discharge construction stormwater under the Kansas Construction Storm water General Permit. Anyone who disturbs less than one (1) acre may also be required to obtain authorization to discharge construction stormwater runoff when KDHE believes the water quality impact warrants consideration. Construction activities include construction of roads accessing the well site and construction of the well drilling pad. Information on construction stormwater permitting can be found at the following website: www.kdheks.gov/stormwater.

AUTHORITY

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information. K.A.R. 28-46-22 requires this certification and that this application be signed by an executive officer of a level of at least Vice-President or other authorized signatory as described at the Code of Federal Regulations 40 CFR 144.32 in effect on April 1, 1993.

_____

Printed Name of Authorized Signatory

_____

Signature of Authorized Signatory Company Title